



BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE PILANI

EEE-F435 Digital Image Processing

Assignment -4

Guided By- Dr.K.K Gupta

Prepared by- Vaibhav Ajmera

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clc;

```
clear all;  
close all;  
RGB_image=imread('pic.png');
```

```
temp = rgb2gray(RGB_image);  
temp1=double(temp);
```

% Entropy Calculation

```
Input_Image = temp1;  
histogram_ = hist( Input_Image(:),0:255);  
symbols = 0:255;  
p = histogram_/sum(histogram_);  
ind = find(p >0);  
ExistingSymbols = symbols(ind);  
SymbProbabilities = p(ind);  
H = - sum(SymbProbabilities.*log2(SymbProbabilities));
```

% Huffman Algorithm

```
gray_im = rgb2gray(RGB_image);  
gray_im = gray_im(:);  
[N M] = size(gray_im);  
Counter = zeros(256,1);
```

```
for i = 1:N  
    for j = 1:M
```

```

        Counter(gray_im(i,j)+1)=Counter(gray_im(i,j)+1)+1;
    end
end
prob = Counter/(M*N);
symbols = 0:255;

[dict,averagelength] = huffmandict(symbols,prob);
efficiency = H/averagelength *100;

% Printing the desired values
fprintf(' Entropy of the selfie Image : %f \n ',H);
fprintf('Average Codelength of Huffman coding : %f \n',averagelength);

fprintf('Efficiency of Huffman coding : %f \n',efficiency);

```

Results:

Entropy of the selfie Image : 7.780759

Average Codelength of Huffman coding : 7.784562

Efficiency of Huffman coding : 99.951143